

# Oregon Plan Habitat Monitoring:

## An assessment of status and trends in fish habitat



Aquatic Inventories Program  
Oregon Department of Fish and Wildlife  
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ED\_454-000324350

EPA-6822\_019978

# Today's Discussion

- The intentions of Oregon Plan monitoring
- Highlights of the monitoring\*
- Trends in stream habitat
- Status of salmonid habitat
- Richness of data available (fish and habitat)  
\*focus on coast basins

# Key Messages

- Forested landscape accounts for the majority of anadromous and resident fish stream habitat
  - Small, medium, and large stream types
- Stream habitat quality stable
  - But lot's of room for improvement
- Large wood in streams and recruitment are primary concerns
- Restoration and Land Management practices essential to establish improving trend in habitat



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# Oregon Plan for Salmon and Watersheds

## Focus on Salmon, Collaboration, & Restoration

### ODFW Research & Monitoring

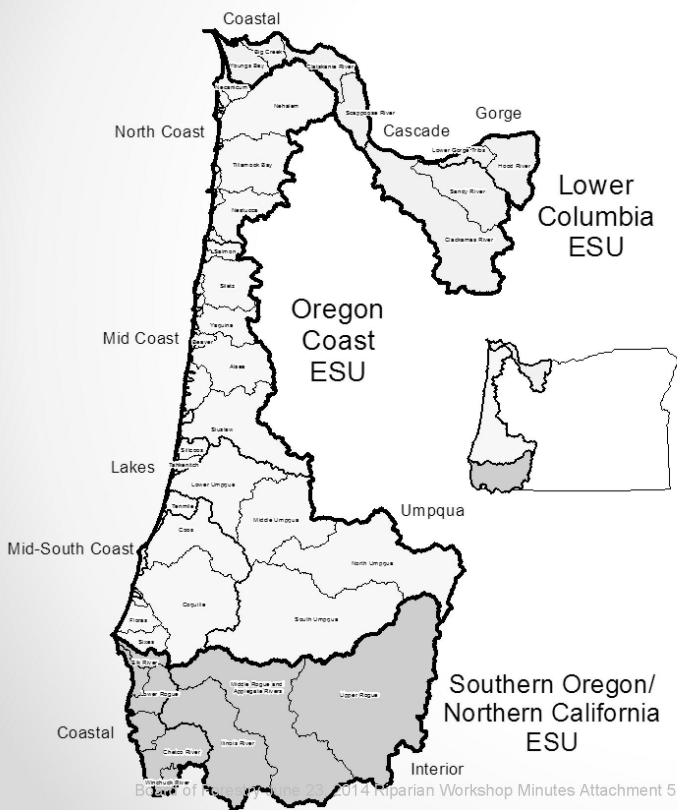
Stream Habitat Surveys

Spawner Abundance & Distribution

Juvenile Fish Surveys

Landscape Scale Analysis

Restoration effectiveness

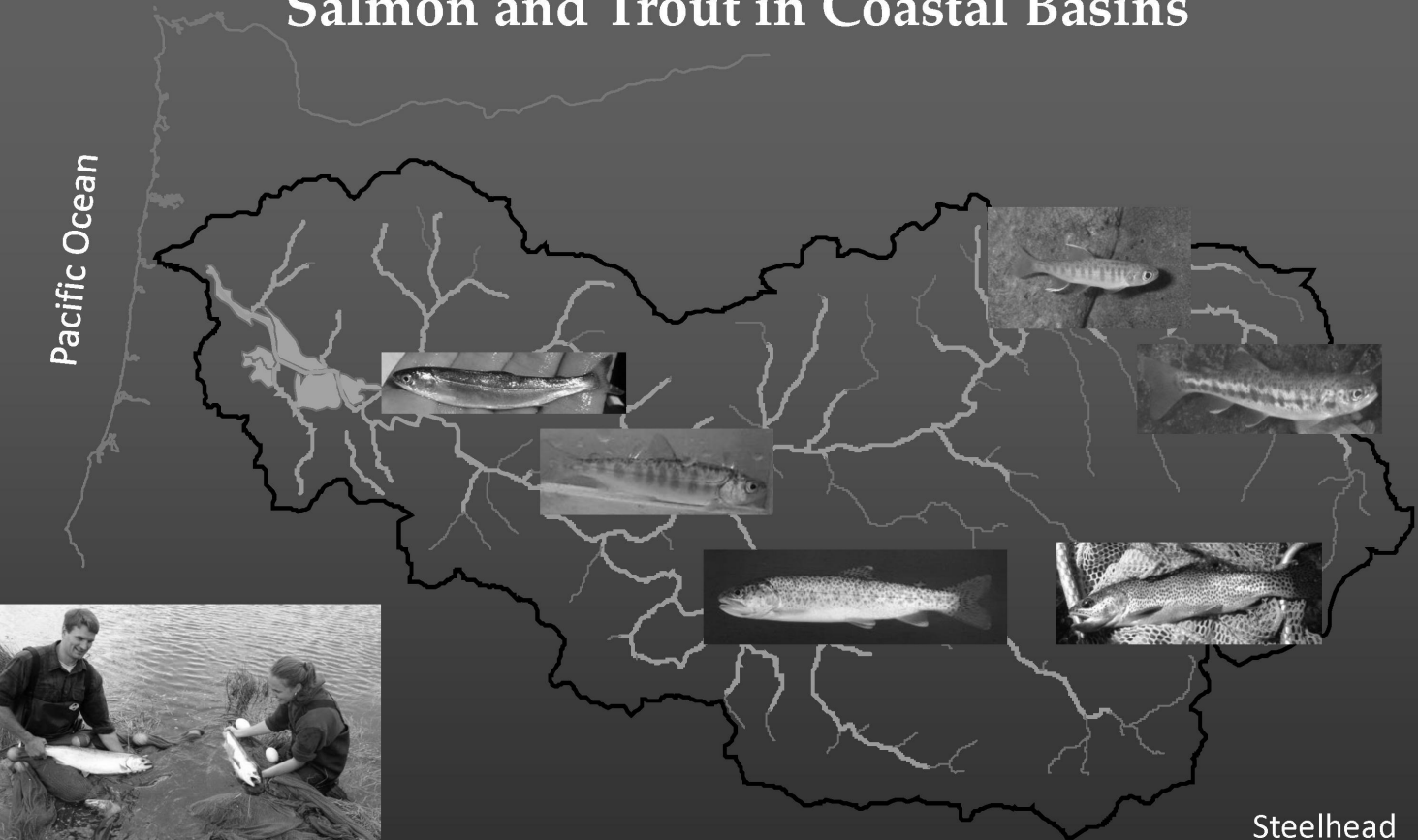


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# Salmon and Trout in Coastal Basins

Pacific Ocean



Chinook

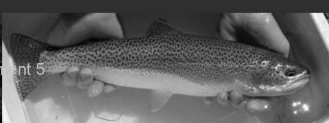
Cutthroat

Coho

Steelhead



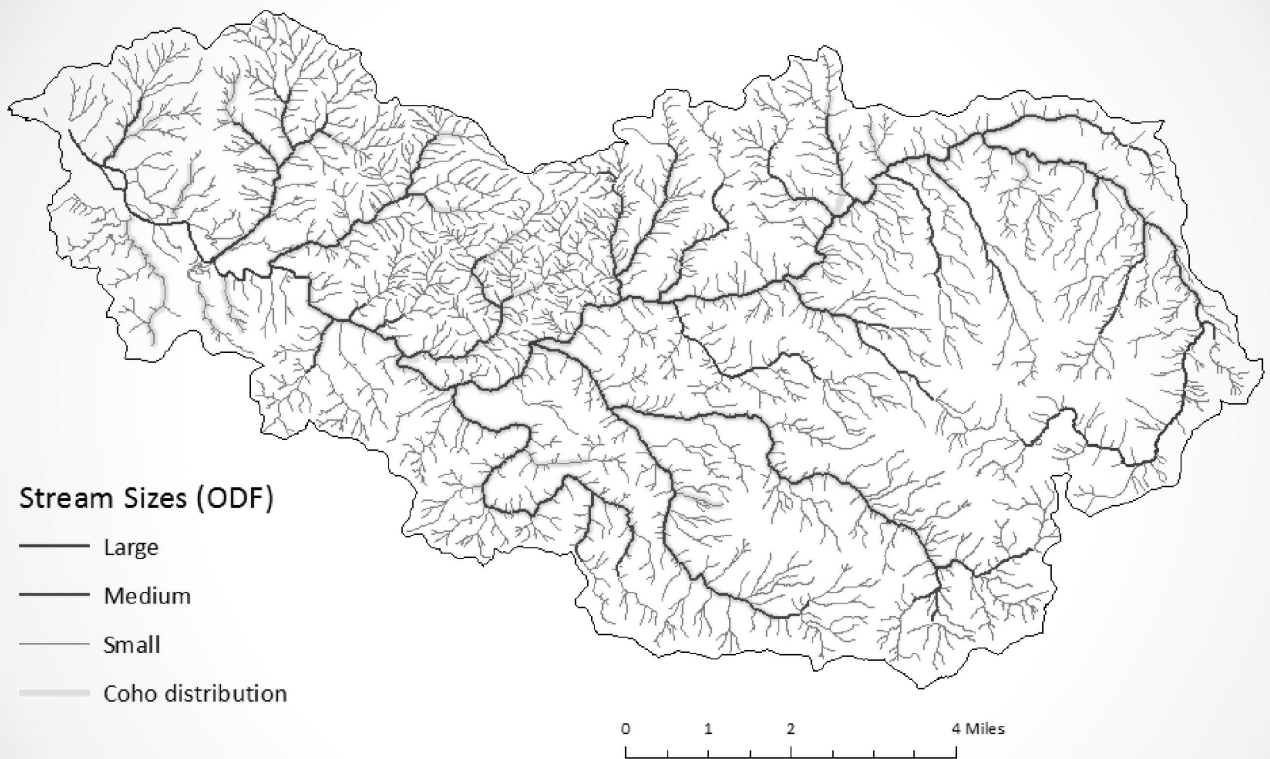
Chum



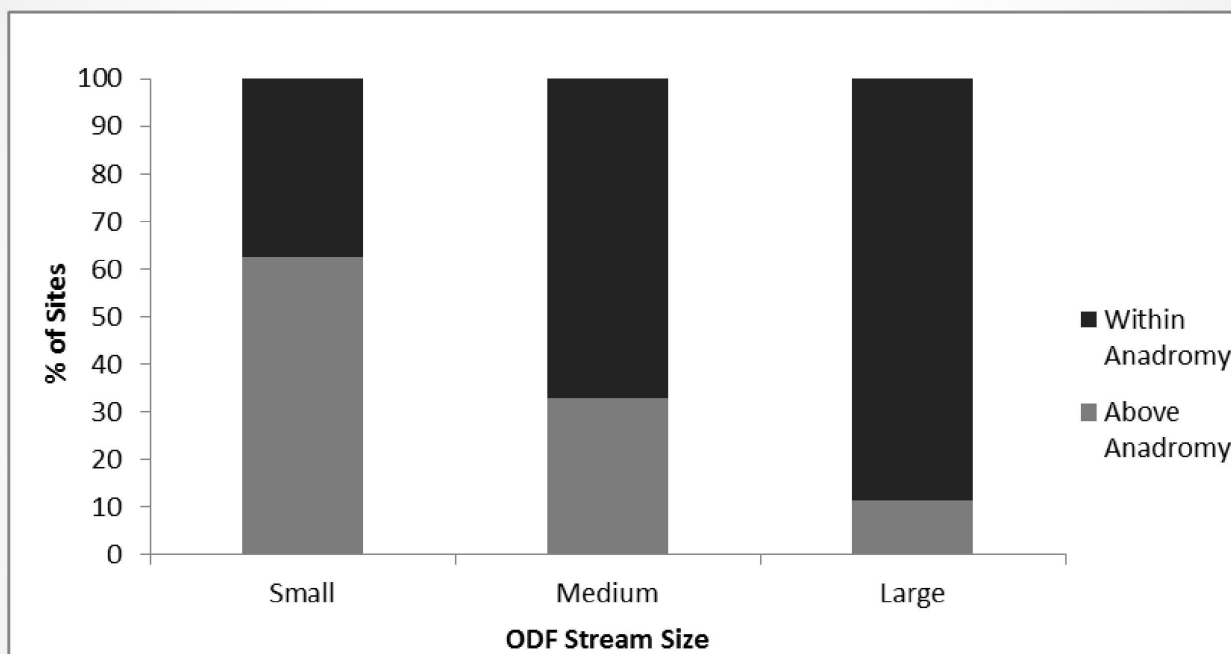
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## Map of forest stream size – Salmon River



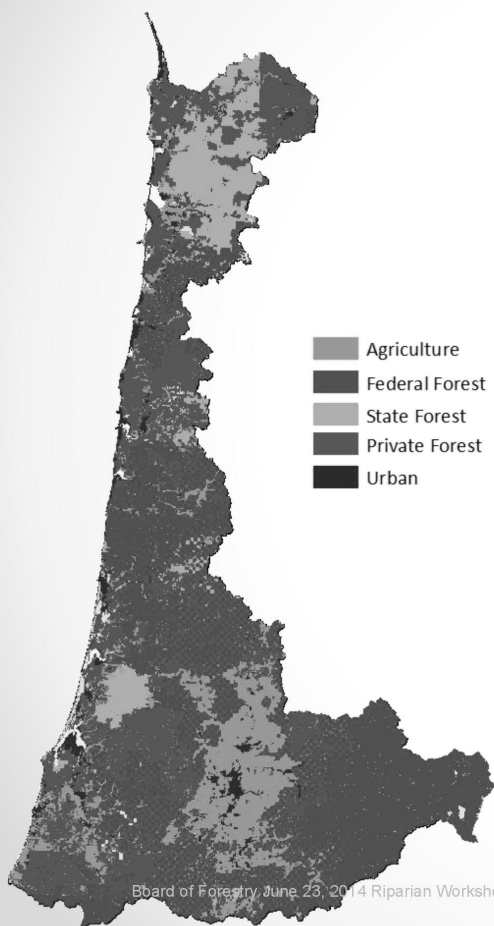
## Fish Use\* by ODF Stream Category



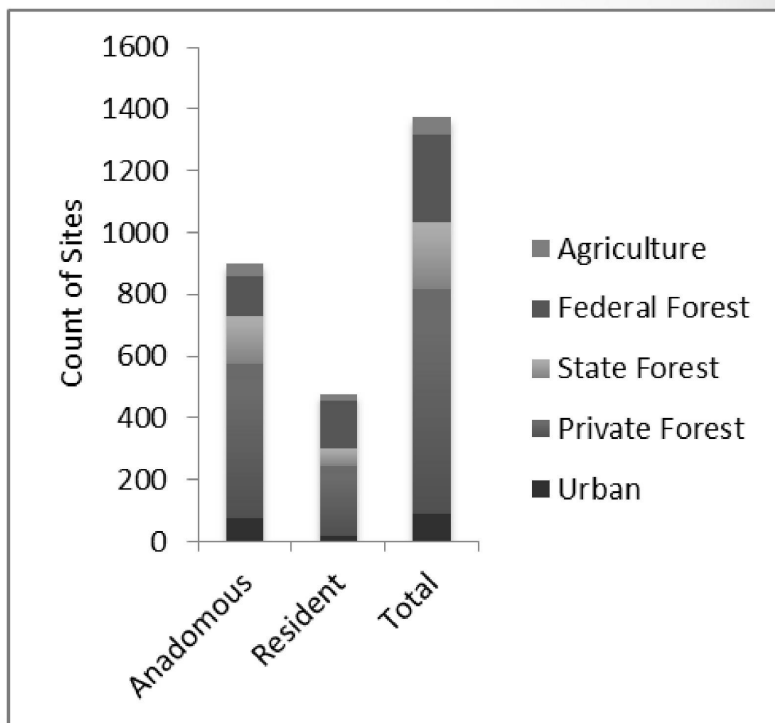
\*70% of streams above anadromy had cutthroat trout (on average 2004-2013)

\*Watersheds > 0.6 km<sup>2</sup>

# Ownership in coastal streams within distribution\* of anadromous and resident salmon and trout



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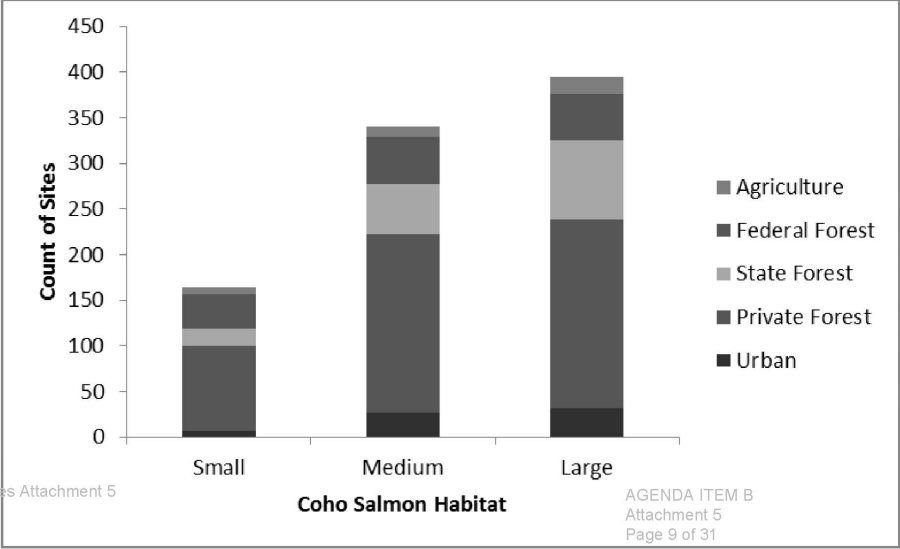
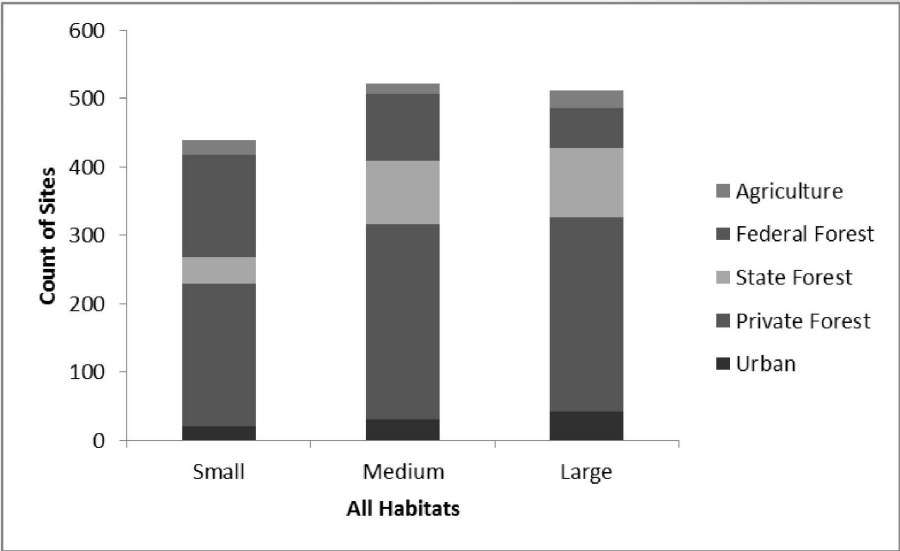


\*Wadeable streams

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# Proportion of streams by ownership and ODF stream size

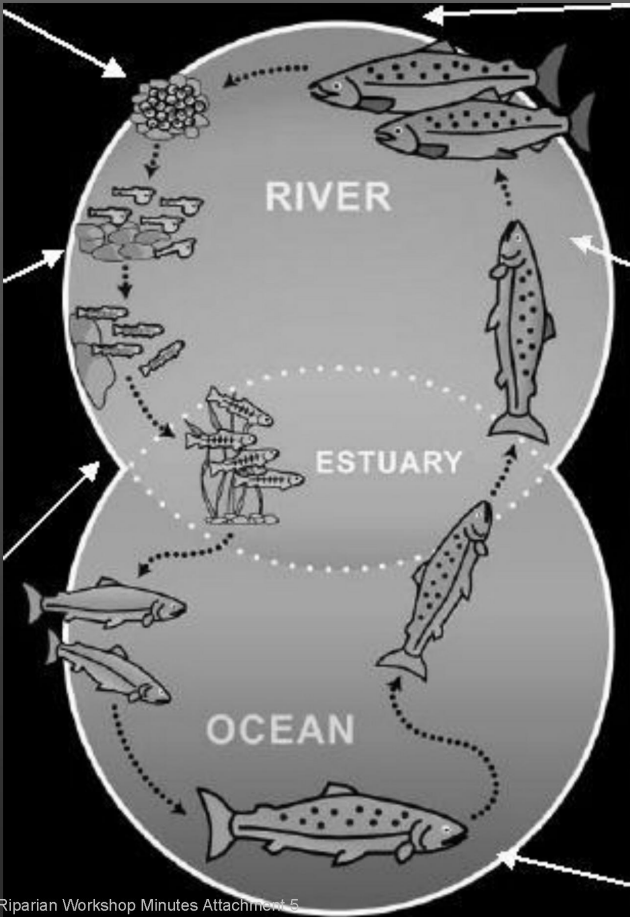
Watersheds >0.6 km<sup>2</sup>



# Land management classes on wadeable streams

- Private forest is the predominant ownership on wadeable streams that support salmon, steelhead, and anadromous cutthroat trout.
- Cutthroat trout have anadromous (sea-run) and resident populations
- Private and federal forests are the predominant ownerships on streams that support resident cutthroat.

# Life Cycle of Pacific Salmon & Trout



# Salmonid Habitat Requirements

- **Habitat Factors Influencing Productivity:**

1. Stream Complexity
2. Large Wood
3. Spawning habitat quality
4. Water Quality

- **Forest Management Issues:**

1. Large Wood Delivery
2. Riparian Stand Condition
3. Beaver Dams
4. Fine Sediment
5. Cold Water





# High Quality Habitat as Currency



High Quality  
Habitat



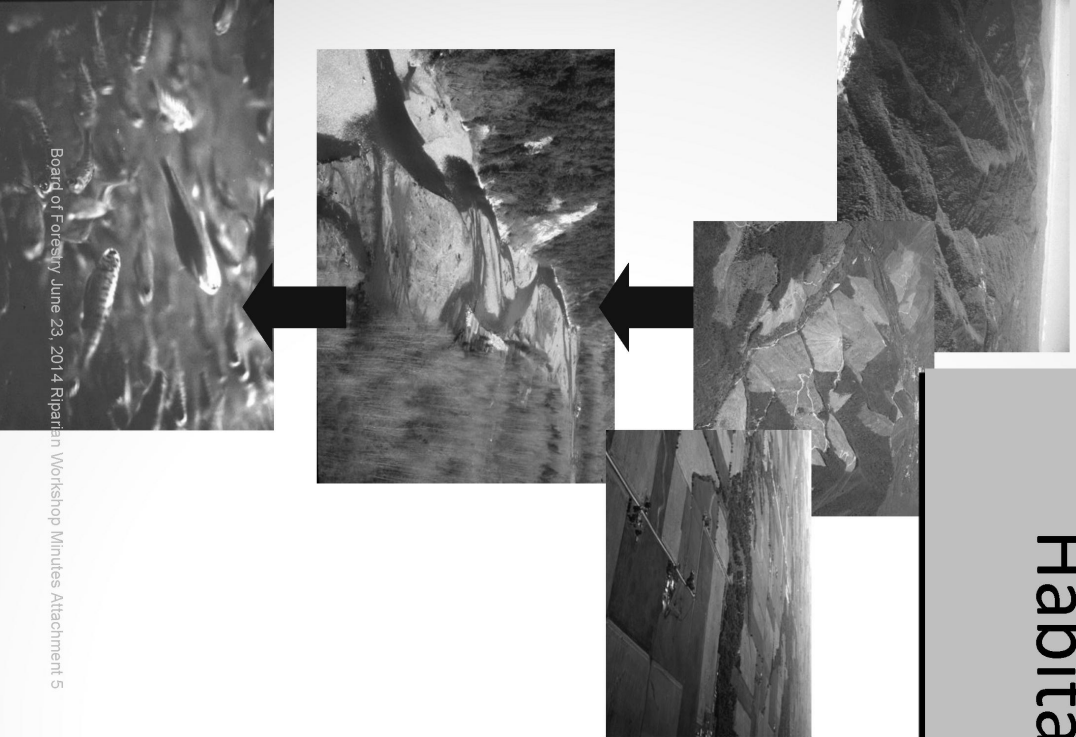
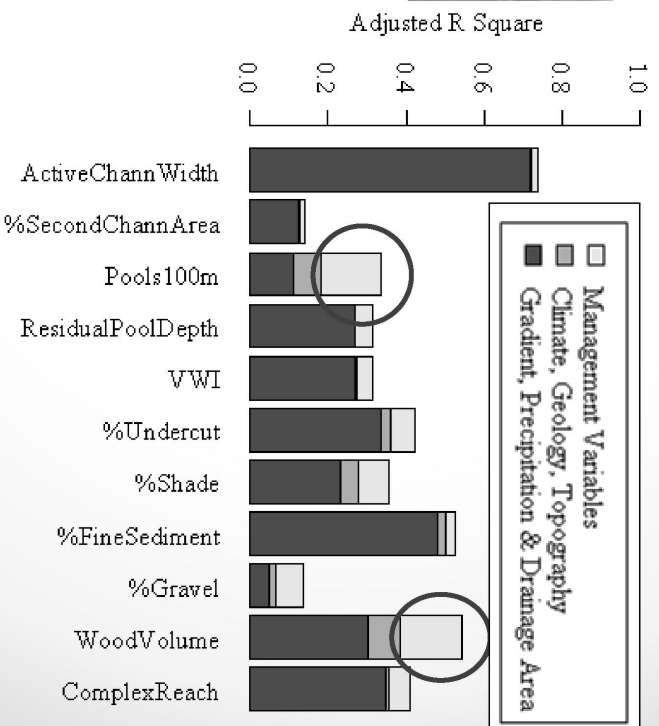
Juvenile Rearing  
Capacity



Adult spawning

- Complex pools with large wood
- Slow water pools – beaver ponds, off channel pools
- Gravel and cobble areas with low amounts of fine sediment

# Habitat Associated with Landscape



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# Status and Trends of Aquatic Habitat in Wadeable Streams on Forest and Non-forest Lands

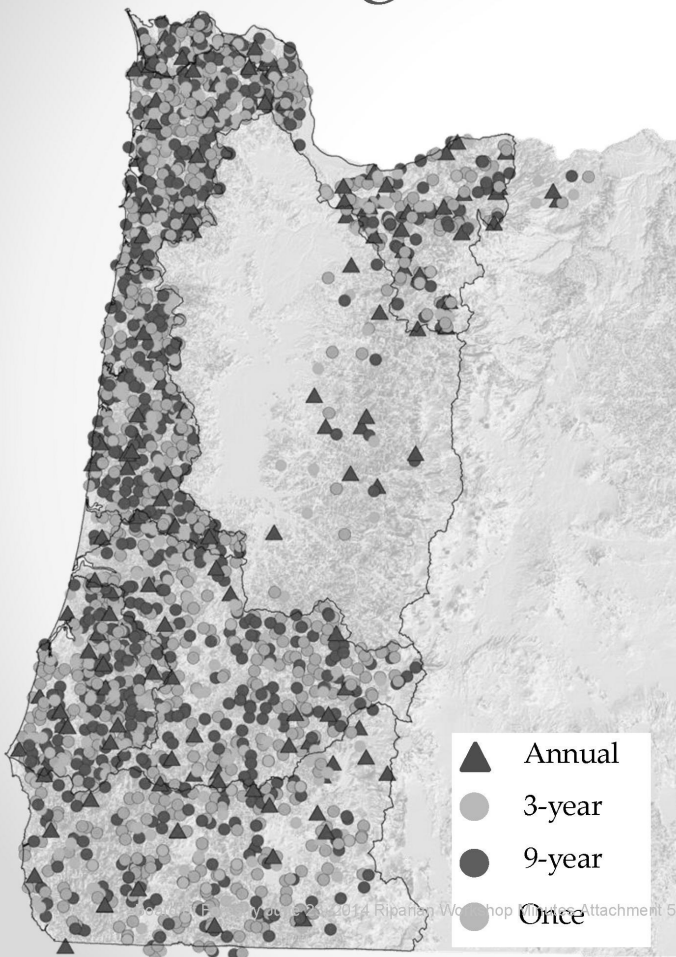
## Indicators

- Pools
- Sediment
- Large wood
- Riparian trees and shade
- Winter rearing capacity (coho)

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# Oregon Plan Habitat Monitoring



- Wadeable ~1<sup>st</sup> – 4<sup>th</sup> Order
- Lower Columbia
  - 80 sites per year
  - 456 unique sites
- Oregon Coast
  - 160 sites per year
  - 1,416 unique sites
- South Coast
  - 40 sites per year
  - 304 unique sites

Wadeable 2014 Riparian Workshop Map Attachment 5

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# Key findings - status

- Stream habitat on managed lands is not as structurally complex as streams in undisturbed watersheds
  - Less large wood
  - Fewer large trees in the riparian areas
  - More fine sediment
  - In order of overall condition from high to low: federal forests, state forests, private forests, agricultural lands
- Shade is high on forested lands, lower on non-forested lands
- Pool amount is high on private forest and non-forest lands
- Amount of gravel is high overall on forest and non-forest lands

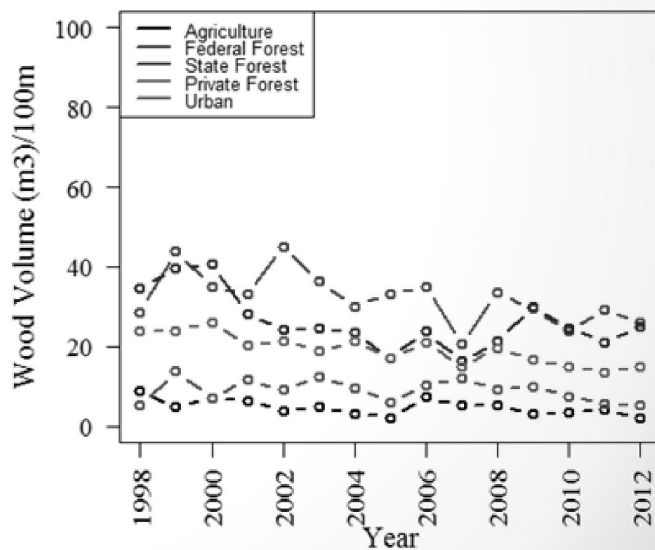
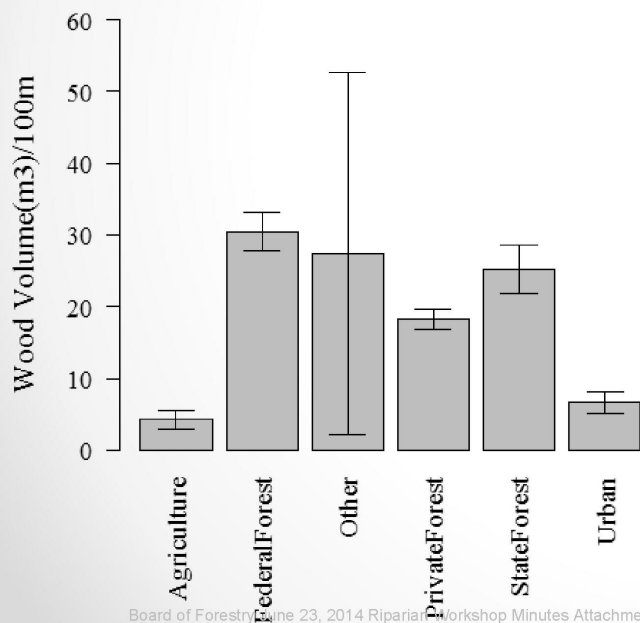
# Key findings - trends

- Stream habitat is stable overall since 1998 with a few exceptions:
  - Wood volume is decreasing in the north coast monitoring area.
  - Fine sediment is increasing in the mid-south coast monitoring area.
  - Winter habitat for juvenile coho is low to moderate quality
- Trends by land ownership:
  - Large wood is significantly decreasing in streams on non-forest lands.
  - Large wood is significantly decreasing in streams on private forest lands.
- Future:
  - Large wood appears to be exported from streams at a higher rate than recruited.
  - Restoration may partially be backfilling the net loss of large wood.
  - Additional high quality habitat is essential to meet coho recovery goals

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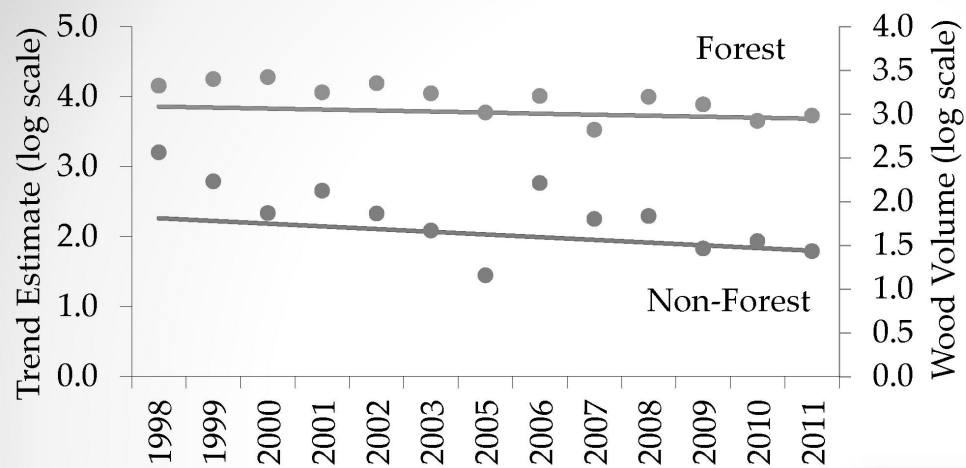
# Large Wood Volume



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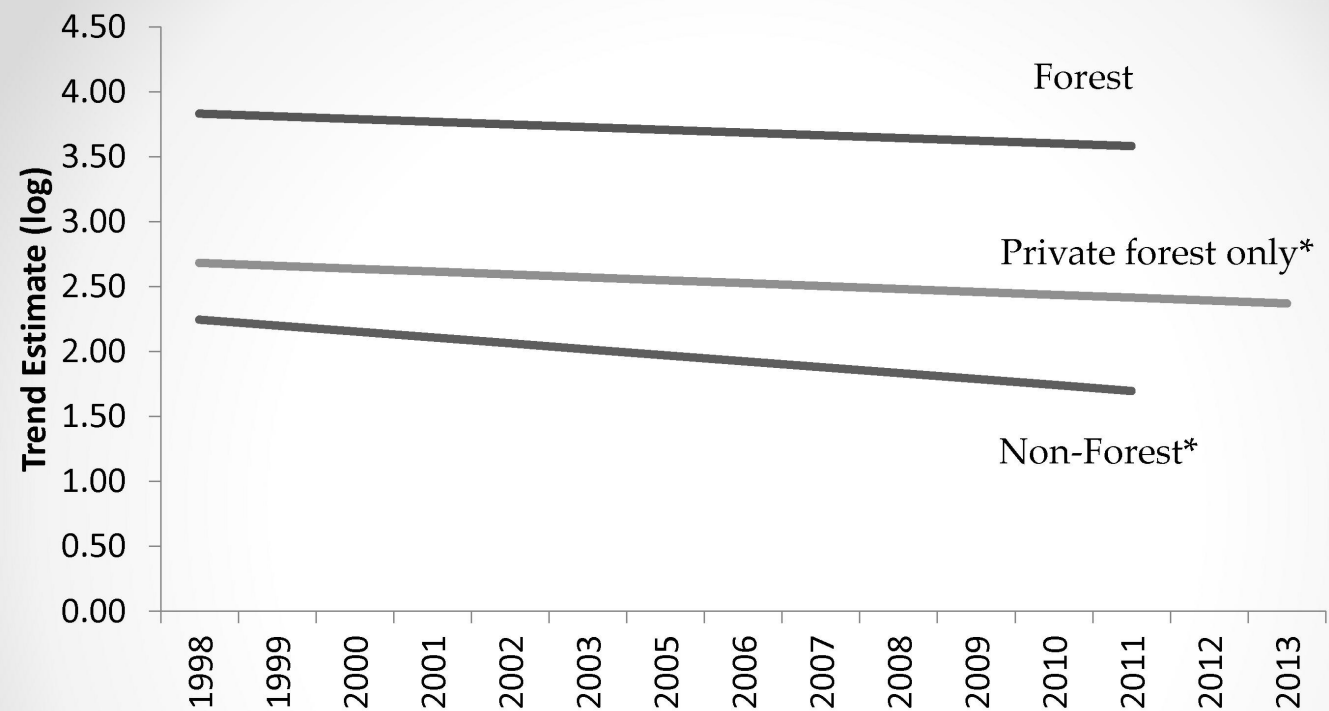
# Instream Wood



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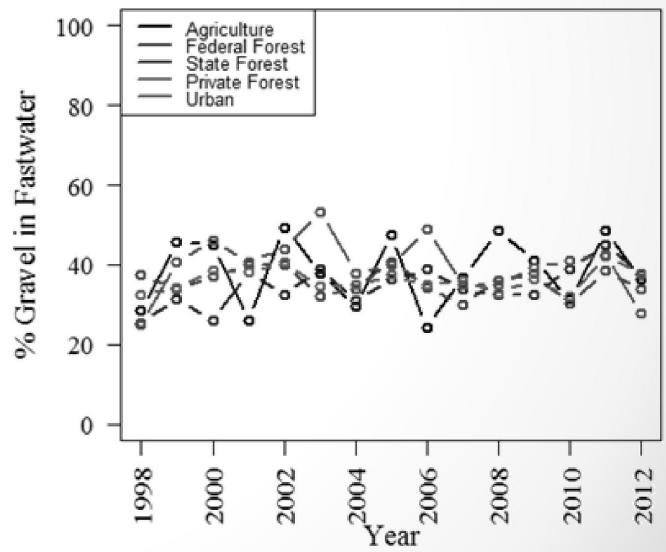
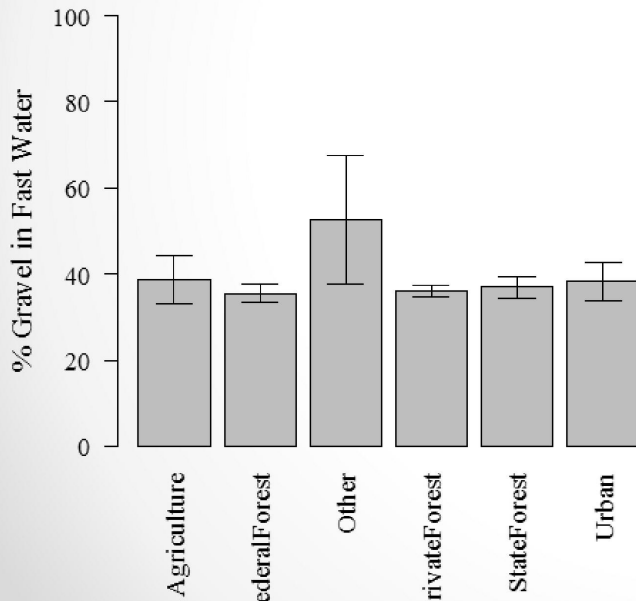




- Trend on forest, non-forest, and private forest only lands.

\* Trends detected

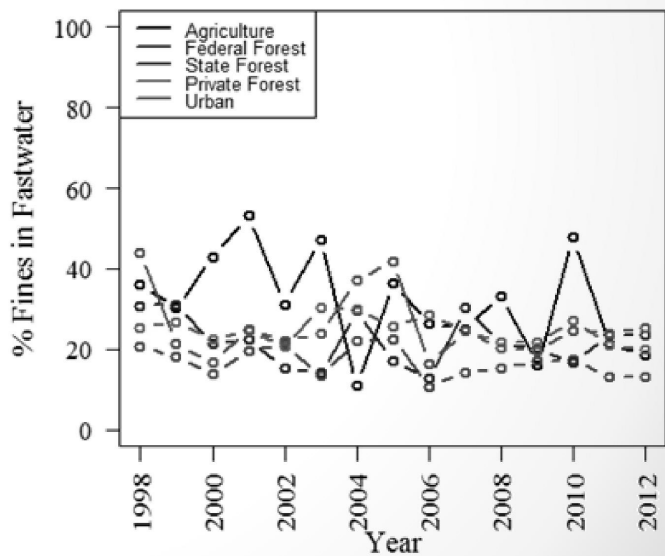
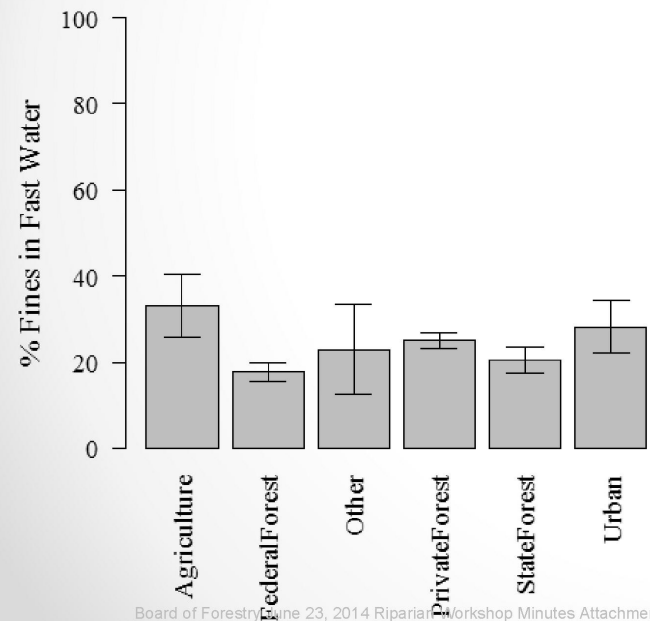
# Gravel



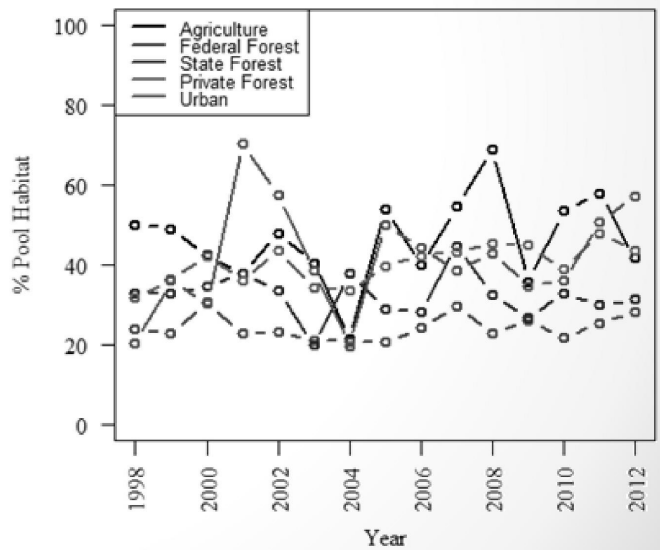
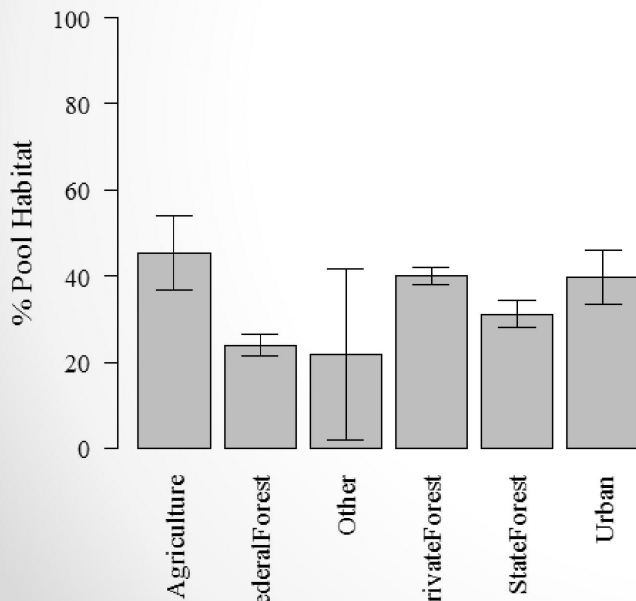
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# Fine Sediment in Riffles



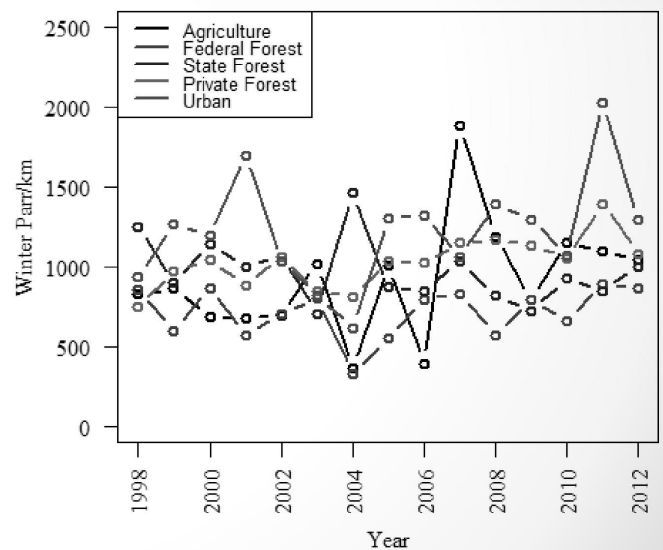
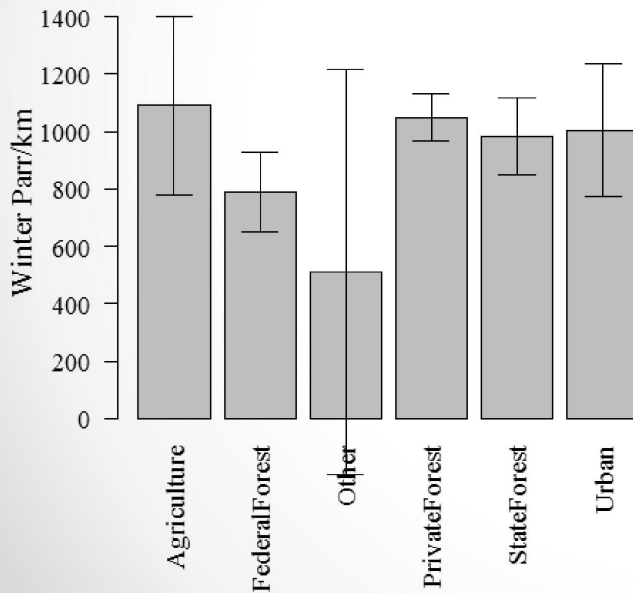
# Pools



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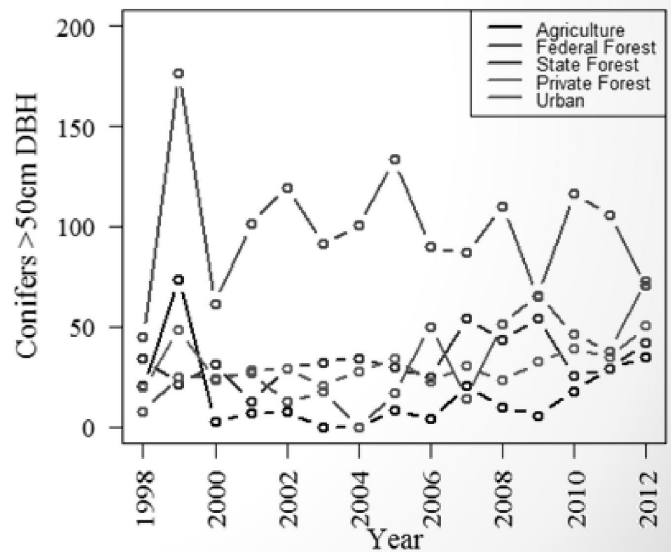
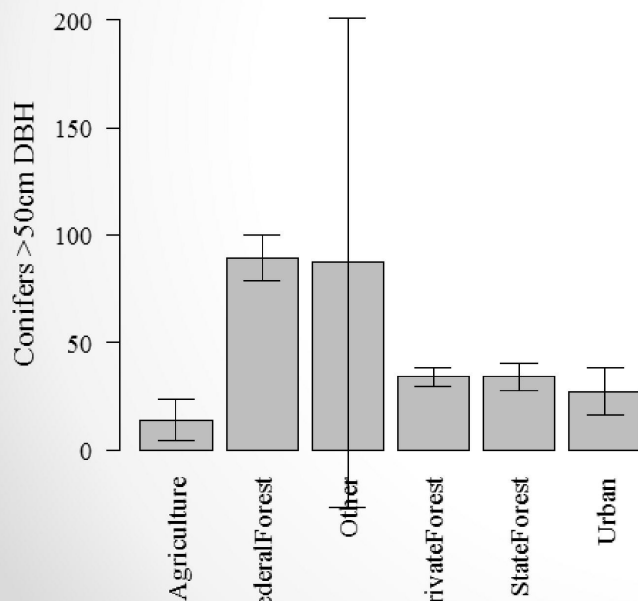
# Coho winter parr/km



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# Conifers > 50 cm DBH in riparian zone (30 m)

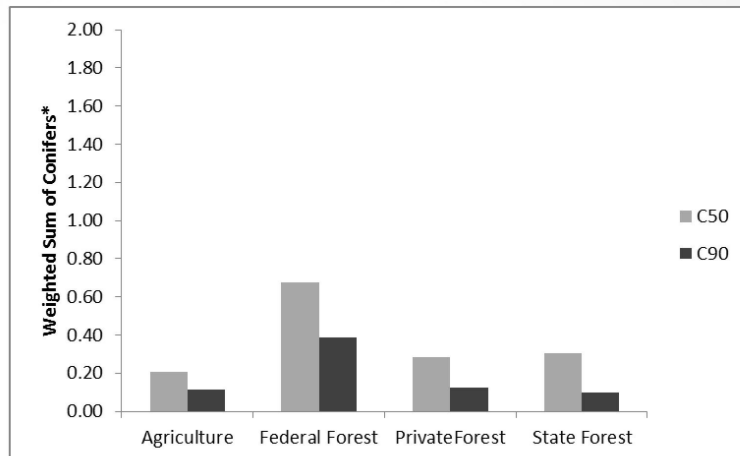


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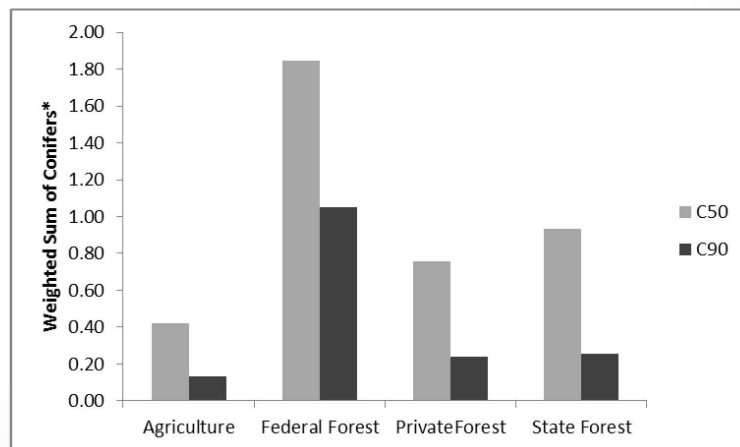
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# Riparian Structure within 30 meters of stream

Inner Riparian Zone –  
0 – 10 meters



Outer Riparian Zone –  
10 – 30 meters



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\* Weighted by number of sites

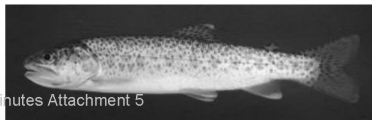
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# Key findings -habitat quality

- Habitat quality and capacity for coho salmon and resident cutthroat trout
  - Coho habitat is below desirable conditions
    - Spawning habitat is low and moderate quality
    - Rearing habitat is low to moderate quality and capacity
    - Winter rearing habitat is considered to limit freshwater productivity of coho populations
  - Cutthroat habitat
    - Cutthroat spawning and emergence habitat is primarily of poor quality, though some reaches are moderate and good quality.
    - Rearing habitat is moderate quality
    - Forested landscapes have better cutthroat rearing habitat than on agricultural and urban landscapes.



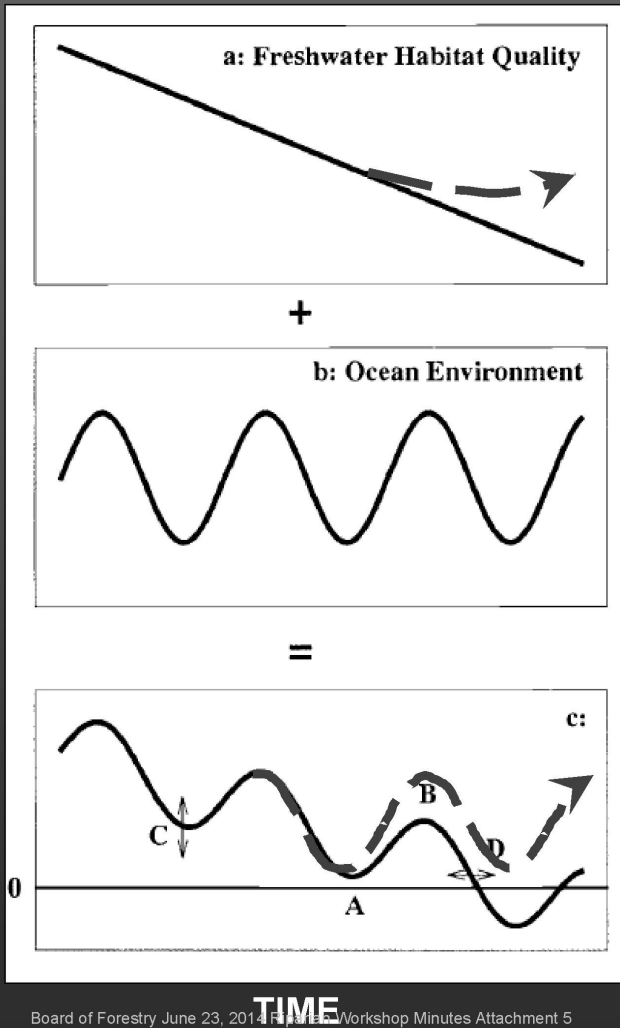
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ESCAPEMENT



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Relationship between freshwater habitat quality, ocean conditions, and adult escapement

Has the trend in freshwater habitat and productivity leveled out, and set the escapement prediction on a different trajectory?

Lawsen, P. 1993. Fisheries

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# Summary

- Small and medium size streams are important for anadromous salmonids
- Status of salmon and trout habitat is generally stable since 1998
- Large wood recruitment and the low amount of high quality habitat is a concern
- It will take a combination of:
  - Improved land use practices, and
  - Active restoration over decades
  - To meet Oregon Plan goals of *“restoring watersheds and recovering the fish and wildlife populations of those watersheds to productive and sustainable levels in a manner that provides substantial environmental, cultural, and economic benefits.”*



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## A black and white photograph of a man standing in a river with his arms raised in front of a waterfall. The text "Thank You" is overlaid in large white letters. The man is wearing a light-colored shirt and dark pants. The waterfall is on the left, and the river flows towards the right. The background is a dense forest of tall trees. The text "014 Environmental Services minutes Attachment 5" is visible in the bottom left corner.



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